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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,543	03/04/2002	Daisuke Kojima	112117	2272

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OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER

PIZIALI, JEFFREY J

ART UNIT	PAPER NUMBER
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2673

DATE MAILED: 11/18/2004.

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/086,543	Applicant(s) KOJIMA ET AL.	
	Examiner Jeff Piziali	Art Unit 2673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
4a) Of the above claim(s) 3,4,6-11,14-29,31,32,34 and 35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,12,13,30 and 33 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 March 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Claims 3-4, 6-11, 14-29, 31, 32, 34, and 35 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicants timely traversed the restriction (election) requirement in the reply filed on 24 August 2004.

2. Applicants' election with traverse of Species I in the reply filed on 24 August 2004 is acknowledged. The traversal is on the ground that the subject matter of all species is sufficiently related that a thorough search for the subject matter of any one species would encompass a search for the subject matter of the remaining species. This is not found persuasive because MPEP §808.01(a), regarding Species Requirement states, "Since the claims are directed to independent inventions, restriction is proper pursuant to 35 U.S.C. 121, and *it is not necessary to show a separate status in the art or separate classification*" (emphasis added). While the field of search for one species may well overlap the field of search for another species, this does not alter the fact that each species constitutes an independent and distinct invention.

The requirement is still deemed proper and is therefore made FINAL.

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3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Priority

4. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

5. The drawings are objected to because the waveforms illustrated in Figs. 10, 11, 14, 15, and 25 are indistinguishable from the respective backing subfield/voltage grids. Corrected drawing sheets, with more distinguishable waveforms, in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be

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labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

6. Claim 12 is objected to because of the following informalities: the claimed quantity "2N-M-1)" in the last line should be changed to read " $(2^{N-M}-1)$ " to reflect the specification's teaching in paragraph 62. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 30 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Regarding claim 30, the phrase "*should* display" (emphasis added) renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1, 2, 5, 12, 13, 30, and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirakawa et al. (US 6,097,358).

Regarding claim 1, Hirakawa discloses a driving method of an electro-optic element [Fig. 1; C] for allowing said electro-optic element to display a level of grayscale, said electro-optic element displaying throughout a frame period [Fig. 3; F] by switching ON-state said electro-optic element during a period corresponding to grayscale data that defines said level of grayscale, said method comprising: sequentially selecting, according to said grayscale data, a plurality of first sub-field periods [Fig. 3; SF1-SF5] continuous with respect to one another and a plurality of second sub-field periods [Fig. 3; SF6-SF10] continuous with respect to one another used for securing a period corresponding to said grayscale data, said plurality of second sub-field periods following consecutively said plurality of first sub-field periods, each of said plurality of second sub-field periods substantially corresponding to a length of a sum of said plurality of first sub-field periods and any one of the first sub-field periods, in a direction from a first sub-field period and a second sub-field period positioned on a boundary [Fig. 3; TR] of said plurality of first sub-field periods and said plurality of second sub-field periods toward a first sub-field period and a second sub-field period at a position most remote from said boundary; and driving

by switching ON-state said electro-optic element during said sub-field periods selected (see Column 6, Line 23 - Column 9, Line 21).

Regarding claim 2, Hirakawa discloses said plurality of first sub-field periods and said plurality of second sub-field periods being included in a same frame period (see Column 7, Lines 57-65).

Regarding claim 5, Hirakawa discloses a period during which said electro-optic element is switched ON-state being inserted in said boundary regardless of said grayscale data (see Fig. 3; Column 8, Lines 44-67).

Regarding claim 12, Hirakawa discloses said grayscale data being composed of N bits (N is an integer not less than 2) to define a level of grayscale having 2 to the N^{th} power kinds; high-order M bits in said N bits defining a level of grayscale said plurality of second sub-field periods should display; low-order (N-M) bits in said N bits defining a level of grayscale said plurality of first sub-field periods should display; and said M is an optimal solution of M given on an assumption that said frame period includes $(2^{N-M}-1)$ first sub-field periods (see Column 6, Line 23 - Column 9, Line 21).

Regarding claim 13, Hirakawa discloses said grayscale data being composed of N bits (N is an integer not less than 2) to define a level of grayscale having 2 to the N^{th} power kinds; a length of each of said second sub-field periods being equal to a length of a period to display a

level of grayscale defined by a least significant bit in high-order M bits in said N bits; the number of said plurality of second sub-field periods being equal to a maximum value specified by said M bits; a length of each of said first sub-field periods being equal to a length of a period to display a level of grayscale defined by a least significant bit in low-order (N-M) bits in said N bits; and the number of said plurality of first sub-field periods being equal to a maximum value specified by said (N-M) bits (see Column 6, Line 23 - Column 9, Line 21).

Regarding claim 30, this claim is rejected by the reasoning applied to claim 1; furthermore Hirakawa discloses a driving device [Fig. 1; 80] of an electro-optic element [Fig. 1; C] for allowing said electro-optic element to display a level of grayscale said electro-optic element should display throughout a frame period [Fig. 3; F] by switching ON-state said electro-optic element during a period corresponding to grayscale data that defines said level of grayscale, said device comprising: a selecting circuit that sequentially selects, according to said grayscale data, a plurality of first sub-field periods [Fig. 3; SF1-SF5] continuous with respect to one another and a plurality of second sub-field periods [Fig. 3; SF6-SF10] continuous with respect to one another used for specifying the period corresponding to said grayscale data, said plurality of second sub-field periods following consecutively said plurality of first sub-field periods, each of said plurality of second sub-field periods substantially corresponding to a length of a sum of said plurality of first sub-field periods and any one of first sub-field periods, in a direction from a first sub-field period and a second sub-field period positioned on a boundary [Fig. 3; TR] of said plurality of first sub-field periods and said plurality of second sub-field periods toward a first sub-field period and a second sub-field period at a remotest position from

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said boundary; and a driving circuit that switches ON-state said electro-optic element during said subfield periods selected (see Column 6, Line 23 - Column 9, Line 21).

Regarding claim 33, Hirakawa discloses electronic equipment, comprising: a display device [Fig. 1; 100], including a plurality of electro-optic elements aligned in a matrix [Fig. 1; 1], that displays an image related to said electronic equipment (see Column 6, Lines 23-67).

Conclusion

12. The related art made of record and not relied upon is considered pertinent to applicant's disclosure. Ito et al. (US 2002/0036610), Nakamura (US 2002/0021264), Tokunaga et al. (US 6,614,413), Someya et al. (US 6,292,159), or Tanaka et al. (US 6,052,112) are cited to further evidence the state of the art pertaining to driving methods of an electro-optic element.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Piziali whose telephone number is (703) 305-8382. The examiner can normally be reached on Monday - Friday (6:30AM - 3PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (703) 305-4938. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



15 November 2004



BIPIN SHALWALA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600